

Supplementary Online Content

Watkins SL, Glantz SA, Chaffee BW. Association of noncigarette tobacco product use with future cigarette smoking among youth in the Population Assessment of Tobacco and Health (PATH) study, 2013-2015. *JAMA Pediatr*. Published online January 2, 2018. doi:10.1001/jamapediatrics.2017.4173

eTable 1. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Sensitivity to Missing Data and Weighting Procedures

eTable 2. Associations of Noncigarette Tobacco Current and Former Use With Subsequent Cigarette Use: Sensitivity to Missing Data and Weighting Procedures

eTable 3. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Sensitivity to Missing Data and Weighting Procedures

eTable 4. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Sensitivity to Adjustment for Baseline Cigarette Susceptibility or Marijuana Ever Use

eTable 5. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Sensitivity to Modeling Each Baseline Tobacco Product Individually

eTable 6. Associations of Noncigarette Tobacco Current and Former Use With Subsequent Cigarette Use: Sensitivity to Modeling Each Baseline Tobacco Product Individually

eTable 7. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Sensitivity to Specifying Polytomous Outcomes

eTable 8. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Adjustment Variable Coefficients Shown

eTable 9. Associations of Noncigarette Tobacco Current and Former Use With Subsequent Cigarette Use: Adjustment Variable Coefficients Shown

eTable 10. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Adjustment Variable Coefficients Shown

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Sensitivity to Missing Data and Weighting Procedures

Predictors:	Listwise deletion				Listwise deletion with replicate weights			
	Cigarette ever use		Cigarette past 30-day use		Cigarette ever use		Cigarette past 30-day use	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
e-cigarettes	3.31 (2.33, 4.72)	2.47 (1.73, 3.52)	2.16 (1.28, 3.66)	1.67 (1.00, 2.8)	3.31 (2.23, 4.93)	2.47 (1.64, 3.72)	2.16 (1.17, 3.99)	1.67 (0.92, 3.03)
hookah	2.74 (1.86, 4.06)	1.85 (1.25, 2.72)	2.95 (1.76, 4.94)	2.13 (1.29, 3.53)	2.74 (1.83, 4.11)	1.85 (1.26, 2.70)	2.95 (1.65, 5.27)	2.13 (1.18, 3.84)
other combustables	2.31 (1.48, 4.72)	1.85 (1.20, 2.87)	2.54 (1.41, 4.61)	1.97 (1.10, 3.54)	2.31 (1.55, 3.43)	1.85 (1.26, 2.72)	2.54 (1.27, 5.09)	1.97 (1.01, 3.84)
smokeless	2.53 (1.53, 4.20)	1.46 (0.86, 2.49)	3.85 (2.11, 7.04)	2.07 (1.08, 3.97)	2.53 (1.37, 4.68)	1.46 (0.81, 2.65)	3.85 (2.13, 6.98)	2.07 (1.08, 3.95)
female		1.06 (0.86, 1.32)		0.96 (0.70, 1.31)		1.06 (0.84, 1.35)		0.96 (0.69, 1.33)
age (12-17)		1.26 (1.17, 1.35)		1.35 (1.22, 1.51)		1.26 (1.17, 1.36)		1.35 (1.20, 1.52)
Non-Hisp.Black (vs. White)		0.67 (0.47, 0.97)		0.75 (0.46, 1.21)		0.67 (0.46, 0.99)		0.75 (0.45, 1.25)
Hispanic/Latinx (vs. White)		1.04 (0.79, 1.37)		0.85 (0.58, 1.25)		1.04 (0.77, 1.41)		0.85 (0.55, 1.32)
Other (vs. White)		0.70 (0.47, 1.05)		0.58 (0.33, 1.01)		0.70 (0.45, 1.10)		0.58 (0.32, 1.05)
parent's edu. ≥ bachelors		0.79 (0.62, 1.00)		0.60 (0.43, 0.85)		0.79 (0.62, 1.00)		0.60 (0.42, 0.86)
urban (vs. non-urban)		1.02 (0.76, 1.37)		0.94 (0.63, 1.39)		1.02 (0.73, 1.43)		0.94 (0.58, 1.52)
sensation seeking (3-15)		1.10 (1.05, 1.15)		1.09 (1.02, 1.16)		1.10 (1.05, 1.15)		1.09 (1.02, 1.16)
alcohol ever use		1.39 (1.09, 1.76)		1.20 (0.85, 1.71)		1.39 (1.04, 1.85)		1.20 (0.82, 1.75)
lived with tobacco user		1.43 (1.14, 1.79)		1.59 (1.16, 2.19)		1.43 (1.14, 1.80)		1.59 (1.09, 2.34)
noticed cig. warning (1-5)		1.02 (0.94, 1.11)		0.98 (0.88, 1.10)		1.02 (0.94, 1.11)		0.98 (0.87, 1.11)
has favorite tobacco ad		1.55 (1.13, 2.12)		2.02 (1.35, 3.03)		1.55 (1.11, 2.17)		2.02 (1.31, 3.12)
summer interview		0.67 (0.52, 0.86)		0.73 (0.51, 1.03)		0.67 (0.51, 0.87)		0.73 (0.51, 1.04)
N	9909	9206	9907	9204	9909	9206	9907	9204

Abbreviations: OR = odds ratio; CI = confidence interval

eTable 2. Associations of Noncigarette Tobacco Current and Former Use With Subsequent Cigarette Use: Sensitivity to Missing Data and Weighting Procedures

Predictors:	Listwise deletion				Listwise deletion with replicate weights			
	Cigarette ever use		Cigarette past 30-day use		Cigarette ever use		Cigarette past 30-day use	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
e-cigarettes -	3.80	3.06	2.50	2.30	3.80	3.06	2.50	2.30
current	(1.90, 7.59)	(1.58, 5.91)	(0.09, 6.93)	(0.90, 5.92)	(1.78, 8.10)	(1.51, 6.19)	(0.67, 9.35)	(0.69, 7.73)
e-cigarettes -	3.33	2.34	2.03	1.42	3.33	2.34	2.03	1.42
former	(2.26, 4.91)	(1.57, 3.49)	(1.15, 3.57)	(0.79, 2.55)	(2.09, 5.29)	(1.44, 3.82)	(1.05, 3.93)	(0.74, 2.73)
hookah -	3.73	2.91	3.86	3.15	3.73	2.91	3.86	3.15
current	(1.64, 8.44)	(1.32, 6.39)	(1.22, 12.16)	(1.07, 9.27)	(1.56, 8.91)	(1.26, 6.72)	(1.02, 14.63)	(0.90, 11.01)
hookah -	2.36	1.53	2.49	1.72	2.36	1.53	2.49	1.72
former	(1.54, 3.63)	(1.00, 2.35)	(1.45, 4.26)	(.98, 3.01)	(1.51, 3.71)	(1.00, 2.34)	(1.35, 4.58)	(0.89, 3.35)
other comb. -	3.97	3.43	5.02	3.87	3.97	3.43	5.02	3.87
current	(1.90, 8.30)	(1.51, 7.80)	(1.92, 13.14)	(1.34, 11.12)	(1.76, 8.95)	(1.43, 8.26)	(1.79, 14.10)	(1.29, 11.61)
other comb. -	1.84	1.50	1.74	1.42	1.84	1.50	1.74	1.42
former	(1.05, 3.21)	(0.88, 2.54)	(0.83, 3.61)	(0.69, 2.89)	(1.16, 2.91)	(0.98, 2.29)	(0.72, 4.17)	(0.61, 3.27)
smokeless -	1.43	0.35	2.66	0.50	1.43	0.35	2.66	0.50
current	(0.25, 8.31)	(0.06, 2.14)	(0.33, 21.46)	(0.06, 4.02)	(0.21, 9.71)	(0.04, 2.77)	(0.24, 29.41)	(0.04, 6.04)
smokeless -	2.92	1.92	4.65	2.99	2.92	1.92	4.65	2.99
former	(1.73, 4.91)	(1.10, 3.34)	(2.54, 8.54)	(1.50, 5.96)	(1.72, 4.95)	(1.15, 3.19)	(2.72, 7.95)	(1.59, 5.63)
female		1.06		0.97		1.06		0.97
		(0.85, 1.32)		(0.71, 1.32)		(0.84, 1.35)		(0.69, 1.34)
age (12-17)		1.26		1.35		1.26		1.35
		(1.17, 1.35)		(1.22, 1.50)		(1.17, 1.35)		(1.20, 1.52)
Non-Hisp.Black		0.65		0.71		0.65		0.71
(vs. White)		(0.45, 0.95)		(0.43, 1.16)		(0.44, 0.96)		(0.42, 1.18)
Hispanic/Latinx		1.05		0.84		1.05		0.84
(vs. White)		(0.79, 1.38)		(0.57, 1.24)		(0.77, 1.42)		(0.53, 1.32)
Other		0.68		0.54		0.68		0.54
(vs. White)		(0.45, 1.03)		(0.31, 0.95)		(0.43, 1.09)		(0.29, 1.00)
parent's edu.		0.78		0.59		0.78		0.59
≥ bachelors		(0.61, 0.99)		(0.42, 0.84)		(0.61, 1.00)		(0.41, 0.85)
urban (vs. non-		0.97		0.90		0.97		0.90
urban)		(0.73, 1.31)		(0.6, 1.34)		(0.71, 1.35)		(0.56, 1.44)
sensation		1.10		1.09		1.10		1.09
seeking (3-15)		(1.06, 1.15)		(1.03, 1.16)		(1.06, 1.15)		(1.03, 1.16)
alcohol ever		1.40		1.20		1.40		1.20
use		(1.10, 1.78)		(0.84, 1.71)		(1.06, 1.86)		(0.82, 1.75)
lived with		1.44		1.59		1.44		1.59

tobacco user	(1.15, 1.81)	(1.15, 2.18)	(1.15, 1.81)	(1.08, 2.32)
noticed cig.	1.01	0.98	1.01	0.98
warning (1-5)	(0.93, 1.10)	(0.87, 1.10)	(0.93, 1.10)	(0.85, 1.11)

	Listwise deletion				Listwise deletion with replicate weights			
	Cigarette ever use		Cigarette past 30-day use		Cigarette ever use		Cigarette past 30-day use	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
has favorite		1.59		2.12		1.59		2.12
tobacco ad		(1.16, 2.18)		(1.41, 3.18)		(1.14, 2.23)		(1.37, 3.28)
summer		0.66		0.72		0.66		0.72
interview		(0.51, 0.86)		(0.51, 1.02)		(0.51, 0.87)		(0.50, 1.03)
N	9867	9175	9865	9173	9867	9175	9865	9173

Abbreviations: OR = odds ratio; CI = confidence interval

eTable 3. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Sensitivity to Missing Data and Weighting Procedures

Predictors:	Listwise deletion				Listwise deletion with replicate weights			
	Cigarette ever use		Cigarette past 30-day use		Cigarette ever use		Cigarette past 30-day use	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
e-cigarettes	4.62 (3.10, 6.89)	2.87 (1.86, 4.43)	2.98 (1.55, 5.74)	1.89 (0.95, 3.77)	4.62 (2.92, 7.32)	2.87 (1.71, 4.83)	2.98 (1.40, 6.34)	1.89 (0.84, 4.24)
hookah	4.52 (2.90, 7.05)	2.40 (1.47, 3.91)	4.31 (2.31, 8.04)	2.49 (1.28, 4.84)	4.52 (2.89, 7.08)	2.40 (1.52, 3.79)	4.31 (2.20, 8.43)	2.49 (1.18, 5.24)
other combustables	3.52 (1.94, 6.40)	2.26 (1.20, 4.27)	5.25 (2.61, 10.58)	3.30 (1.53, 7.13)	3.52 (2.13, 5.81)	2.26 (1.29, 3.96)	5.25 (2.51, 11.01)	3.30 (1.48, 7.38)
smokeless	3.44 (1.74, 6.80)	1.59 (0.73, 3.46)	4.34 (1.74, 10.8)	1.77 (0.65, 4.86)	3.44 (1.37, 8.66)	1.59 (0.50, 5.04)	4.34 (1.34, 14.10)	1.77 (0.45, 6.95)
polyuse	8.55 (5.96, 12.26)	4.08 (2.69, 6.18)	9.03 (5.64, 14.45)	4.00 (2.28, 7.03)	8.55 (6.03, 12.11)	4.08 (2.75, 6.06)	9.03 (5.68, 14.35)	4.00 (2.34, 6.84)
female		1.05 (0.85, 1.30)		0.94 (0.69, 1.28)		1.05 (0.84, 1.32)		0.94 (0.69, 1.28)
age (12-17)		1.26 (1.17, 1.35)		1.35 (1.22, 1.50)		1.26 (1.17, 1.36)		1.35 (1.20, 1.52)
Non-Hisp.Black (vs. White)		0.67 (0.47, 0.97)		0.73 (0.46, 1.19)		0.67 (0.46, 0.98)		0.73 (0.44, 1.23)
Hispanic/Latinx (vs. White)		1.03 (0.78, 1.35)		0.83 (0.57, 1.21)		1.03 (0.76, 1.39)		0.83 (0.54, 1.29)
Other (vs. White)		0.72 (0.48, 1.07)		0.59 (0.33, 1.02)		0.72 (0.46, 1.12)		0.59 (0.32, 1.06)
parent's edu. ≥ bachelors		0.79 (0.63, 1.01)		0.62 (0.44, 0.87)		0.79 (0.63, 1.00)		0.62 (0.44, 0.88)
urban (vs. non-urban)		1.02 (0.76, 1.38)		0.93 (0.62, 1.39)		1.02 (0.73, 1.43)		0.93 (0.57, 1.51)
sensation seeking (3-15)		1.10 (1.05, 1.15)		1.09 (1.03, 1.16)		1.10 (1.05, 1.15)		1.09 (1.03, 1.16)
alcohol ever use		1.38 (1.09, 1.76)		1.20 (0.84, 1.70)		1.38 (1.04, 1.85)		1.20 (0.83, 1.73)
lived with tobacco user		1.43 (1.15, 1.79)		1.63 (1.19, 2.23)		1.43 (1.14, 1.81)		1.63 (1.12, 2.37)
noticed cig. warning (1-5)		1.02 (0.94, 1.11)		0.99 (0.88, 1.10)		1.02 (0.94, 1.11)		0.99 (0.87, 1.12)
has favorite tobacco ad		1.53 (1.12, 2.10)		2.06 (1.38, 3.07)		1.53 (1.09, 2.15)		2.06 (1.34, 3.16)
summer interview		0.67 (0.52, 0.86)		0.72 (0.51, 1.03)		0.67 (0.51, 0.87)		0.72 (0.50, 1.03)

N	9909	9206	9907	9204	9909	9206	9907	9204
Abbreviations: OR = odds ratio; CI = confidence interval								

eTable 4. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Sensitivity to Adjustment For Baseline Cigarette Susceptibility or Marijuana Ever Use

Predictors:	Outcome: Cigarette ever use			Outcome: Cigarette past 30-day use		
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
e-cigarettes	4.62 (3.10, 6.89)	2.21 (1.42, 3.44)	2.62 (1.65, 4.18)	2.98 (1.55, 5.74)	1.49 (0.75, 2.98)	1.69 (0.79, 3.61)
hookah	4.52 (2.90, 7.05)	2.30 (1.39, 3.79)	1.84 (1.06, 3.22)	4.31 (2.31, 8.04)	2.36 (1.19, 4.69)	1.98 (0.93, 4.18)
other combustables	3.52 (1.94, 6.40)	1.95 (1.03, 3.69)	2.45 (1.15, 5.21)	5.25 (2.61, 10.58)	2.90 (1.34, 6.25)	3.33 (1.28, 8.64)
smokeless	3.44 (1.74, 6.80)	1.42 (0.65, 3.08)	1.70 (0.75, 3.86)	4.34 (1.74, 10.80)	1.59 (0.59, 4.30)	1.83 (0.63, 5.26)
polyuse	8.55 (5.96, 12.26)	3.67 (2.45, 5.51)	3.41 (2.03, 5.75)	9.03 (5.64, 14.45)	3.65 (2.10, 6.34)	2.80 (1.35, 5.78)
cigarette susceptibility		2.84 (2.22, 3.63)			2.45 (1.73, 3.48)	
marijuana ever use			2.61 (1.79, 3.81)			2.54 (1.52, 4.24)
N	9909	9189	8940	9907	9187	8938

Abbreviations: OR = odds ratio; CI = confidence interval

Notes: All models additionally adjusted for gender, age, race/ethnicity, parents' education, sensation-seeking score, ever use of alcohol, living with another tobacco user, noticing cigarette warnings score, having a favorite tobacco ad, and baseline interview conducted in the summer. Models are listwise deletion models with sample weights.

eTable 5. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Sensitivity to Modeling Each Baseline Tobacco Product Individually

Predictors:	Outcome: Cigarette ever use		Outcome: Cigarette past 30-day use	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
e-cigarettes ever use	5.77 (4.35, 7.64)	3.24 (2.35, 4.48)	4.78 (3.19, 7.19)	2.51 (1.58, 4.00)
hookah ever use	5.16 (3.79, 7.03)	2.59 (1.82, 3.68)	5.38 (3.54, 8.17)	2.80 (1.75, 4.47)
other combustables ever use	5.28 (3.68, 7.56)	2.71 (1.83, 4.01)	6.09 (3.86, 9.61)	2.94 (1.75, 4.95)
smokeless ever use	5.11 (3.31, 7.89)	2.15 (1.30, 3.56)	7.27 (4.25, 12.42)	2.75 (1.43, 5.26)

Abbreviations: OR = odds ratio; CI = confidence interval

Notes: Results are from separate models (i.e., odds ratio for e-cigarettes is from model that does not include baseline use of other tobacco products). Adjusted models include covariates: gender, age, race/ethnicity, parents' education, sensation-seeking score, ever use of alcohol, living with another tobacco user, noticing cigarette warnings score, having a favorite tobacco ad, and baseline interview conducted in the summer. Models are listwise deletion models with sample weights. Sample sizes range from N = 10,365 (hookah, unadjusted) to N = 9319 (other combustables, adjusted).

eTable 6. Associations of Noncigarette Tobacco Current and Former Use With Subsequent Cigarette Use: Sensitivity to Modeling Each Baseline Tobacco Product Individually

Predictors:	Outcome: Cigarette ever use		Outcome: Cigarette past 30-day use	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
e-cigarettes – current	7.61 (4.44, 13.05)	3.98 (2.17, 7.28)	7.04 (3.37, 14.71)	3.55 (1.56, 8.07)
e-cigarettes – former	5.57 (4.04, 7.68)	3.09 (2.14, 4.45)	4.32 (2.68, 6.95)	2.19 (1.28, 3.76)
hookah – current	8.30 (4.52, 15.27)	4.37 (2.22, 8.58)	9.22 (4.26, 19.94)	4.75 (2.02, 11.17)
hookah – former	4.59 (3.23, 6.53)	2.25 (1.51, 3.34)	4.63 (2.87, 7.48)	2.39 (1.40, 4.09)
other combustables - current	9.78 (5.44, 17.59)	5.27 (2.53, 10.96)	12.36 (6.38, 23.93)	5.99 (2.54, 14.13)
other combustables - former	4.37 (2.78, 6.89)	2.25 (1.41, 3.59)	4.58 (2.46, 8.49)	2.30 (1.21, 4.40)
smokeless - current	3.76 (1.24, 11.43)	0.70 (0.20, 2.48)	6.74 (1.91, 23.75)	0.90 (0.19, 4.26)
smokeless - former	5.56 (3.41, 9.05)	2.67 (1.55, 4.59)	7.62 (1.91, 13.91)	3.55 (1.77, 7.10)

Abbreviations: OR = odds ratio; CI = confidence interval

Notes: Results are from separate models (i.e., odds ratio for e-cigarettes is from model that does not include baseline use of other tobacco products). Adjusted models include covariates: gender, age, race/ethnicity, parents' education, sensation-seeking score, ever use of alcohol, living with another tobacco user, noticing cigarette warnings score, having a favorite tobacco ad, and baseline interview conducted in the summer. Models are listwise deletion models with sample weights. Sample sizes range from N = 10,362 (hookah, unadjusted) to N = 9308 (other combustables, adjusted). "Former" use indicates having tried a cigarette by Wave 2 but no use in the past 30-days; "Current" use indicates use of a cigarette within the past 30 days.

eTable 7. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Sensitivity to Specifying Polytomous Outcomes

	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Never smoked cigarettes	(base outcome)	(base outcome)
Predictors of smoked cigarettes (former):		
e-cigarettes	5.75 (3.55, 9.32)	3.52 (2.08, 5.98)
hookah	2.00 (0.70, 5.73)	2.22 (1.14, 4.29)
other	2.59 (1.00, 6.66)	1.32 (0.46, 3.77)
combustables	4.46 (2.48, 8.01)	1.25 (0.41, 3.78)
smokeless	7.23 (4.44, 11.78)	3.76 (2.20, 6.40)
polyuse		
Predictors of smoked cigarettes (current):		
e-cigarettes	3.26 (1.69, 6.28)	2.07 (1.04, 4.12)
hookah	5.36 (2.66, 10.81)	2.61 (1.34, 5.08)
other	4.48 (1.80, 11.15)	3.33 (1.54, 7.21)
combustables	4.60 (2.46, 8.61)	1.78 (0.65, 4.90)
smokeless	10.14 (6.31, 16.30)	4.48 (2.55, 7.88)
polyuse		
N	9909	9206

Abbreviations: RRR = relative risk ratio; CI = confidence interval

Notes: Adjusted models include additional covariates: gender, age, race/ethnicity, parents' education, sensation-seeking score, ever use of alcohol, living with another tobacco user, noticing cigarette warnings score, having a favorite tobacco ad, and baseline interview conducted in the summer. Models are listwise deletion models with sample weights. "Former" use indicates having tried a cigarette by Wave 2 but no use in the past 30-days; "Current" use indicates use of a cigarette within the past 30 days.

eTable 8. Associations of Noncigarette Tobacco Ever Use With Subsequent Cigarette Use: Adjustment Variable Coefficients Shown

Wave 1 use	No. of Observations Before Multiple Imputation	Wave 2 Cigarette Ever Use (n=10,384) ^a			Wave 2 Cigarette Past 30-Day Use (n=10,380) ^b		
		Weighted, Unadjusted Cigarette Ever Use, %	OR (95% CI)		Weighted, Unadjusted Cigarette Past 30-Day Use, %	OR (95% CI)	
			Model 1 ^c	Model 2 ^d		Model 3 ^c	Model 4 ^d
E-cigarettes							
Never	9,923	3.9	1 [Reference]	1 [Reference]	1.8	1 [Reference]	1 [Reference]
Ever	425	19.1	3.50 (2.48, 4.94)	2.53 (1.80, 3.56)	8.2	2.39 (1.42, 4.00)	1.87 (1.15, 3.05)
Hookah							
Never	10,026	4.1	1 [Reference]	1 [Reference]	1.9	1 [Reference]	1 [Reference]
Ever	339	18.3	2.67 (1.81, 3.93)	1.79 (1.23, 2.62)	9.4	2.85 (1.69, 4.79)	1.92 (1.17, 3.17)
non-cigarette combustibles							
Never	9,818	4.2	1 [Reference]	1 [Reference]	1.9	1 [Reference]	1 [Reference]
Ever	226	19.2	2.23 (1.42, 3.49)	1.64 (1.06, 2.54)	10.8	2.47 (1.36, 4.47)	1.78 (1.00, 3.19)
smokeless							
Never	10,101	4.4	1 [Reference]	1 [Reference]	1.9	1 [Reference]	1 [Reference]
Ever	155	18.8	2.64 (1.60, 4.35)	1.66 (1.00, 2.76)	12.5	3.78 (2.07, 6.89)	2.07 (1.10, 3.87)
Female (vs. male)				1.01 (0.82, 1.25)			0.89 (0.65, 1.19)
Age (range, 12-17 years)				1.26 (1.18, 1.35)			1.40 (1.26, 1.55)
Race/ethnicity (reference: non-Hispanic white)							
African American				0.65 (0.46, 0.93)			0.66 (0.41, 1.06)
Hispanic/Latino				1.00 (0.76, 1.30)			0.83 (0.58, 1.19)
Other				0.67 (.46, .98)			
Parent's educational level of bachelors degree or higher (vs no)				0.79 (0.63, .99)			0.59 (0.43, 0.82)
Urban residence (vs non-urban)				1.06 (0.80, 1.40)			0.96 (0.66, 1.41)
Sensation seeking ^e				1.10 (1.06, 1.15)			1.10 (1.03, 1.16)
Alcohol ever use (vs no)				1.47 (1.17, 1.86)			1.23 (0.87, 1.73)

Lived with tobacco user (vs no)	1.40 (1.13, 1.73)			1.58 (1.17, 2.14)
Noticed cigarette warning ^f	1.04 (0.96, 1.12)			1.00 (0.90, 1.12)
Has favorite tobacco advertisement (vs.no)	1.62 (1.20, 2.19)			2.12 (1.43, 3.14)
Questionnaire in summer (vs. no)	0.66 (0.52, 0.85)			0.77 (0.55, 1.08)
Intercept	0.04 (0.03, 0.04)	0.00 (0.00, 0.00)	0.02 (0.01, 0.02)	0.00 (0.00, 0.00)

Abbreviations: OR = odds ratio; CI = confidence interval;

^aFor cigarette use ever, the F statistic was 56.1 in model 1 and 24.6 in model 2 and the largest fraction of missing information was 0.011 in model 1 and 0.0186 in model 2.

^bFor past 30-day cigarette use, the F statistic was 36.8 in model 1 and 19.7 in model 2 and the largest fraction of missing information was 0.028 in model 1 and 0.032 in model 2.

^cModel includes all ever tobacco use categories

^dModel includes all ever tobacco use categories and the following wave 1 covariates: female, age, race/ethnicity, parental educational level, urban residence, sensation seeking, alcohol ever use, living with tobacco user, notice of cigarette warning labels, tobacco advertising receptivity, and summer season.

^eA score from 3 to 15 that aggregated three 5-point Likert-type measures of affinity for frightening things, new and exciting experiences, and exciting and unpredictable friends.

^fA score on a 5-point scale with 1 indicating never and 5 indicating very often.

eTable 9. Associations of Noncigarette Tobacco Current and Former Use With Subsequent Cigarette Use^a: Adjustment Variable Coefficients Shown

Wave 1 use	No. of Observations Before Multiple Imputation	Wave 2 Cigarette Ever Use (n=10,384) ^b			Wave 2 Cigarette Past 30-Day Use (n=10,380) ^c		
		Weighted, Unadjusted Cigarette Ever Use, %	OR (95% CI)		Weighted, Unadjusted Cigarette Past 30-Day Use, %	OR (95% CI)	
			Model 1 ^d	Model 2 ^e		Model 3 ^d	Model 4 ^e
E-cigarettes							
Never	9,923	3.9	1 [Reference]	1 [Reference]	1.8	1 [Reference]	1 [Reference]
Former	319	18.6	3.66 (2.52, 5.32)	2.58 (1.77, 3.76)	7.5	2.42 (1.40, 4.19)	1.84 (1.07, 3.15)
Past 30 days	87	23.8	3.61 (1.82, 7.16)	2.65 (1.38, 5.10)	11.6	2.48 (0.91, 6.78)	2.08 (0.81, 5.40)
Hookah							
Never	10,026	4.1	1 [Reference]	1 [Reference]	1.9	1 [Reference]	1 [Reference]
Former	273	16.4	2.32 (1.52, 3.53)	1.54 (1.02, 2.34)	8.0	2.39 (1.41, 4.05)	1.57 (0.92, 2.68)
Past 30 days	63	26.4	3.78 (1.69, 8.44)	2.58 (1.20, 5.55)	15.0	3.86 (1.24, 12.0)	2.69 (0.91, 7.98)
non-cigarette combustibles							
Never	9,818	4.2	1 [Reference]	1 [Reference]	1.9	1 [Reference]	1 [Reference]
Former	154	15.4	1.65 (0.95, 2.84)	1.22 (0.73, 2.04)	7.8	1.68 (0.84, 3.36)	1.23 (0.62, 2.40)
Past 30 days	59	30.6	3.98 (1.91, 8.32)	3.05 (1.37, 6.77)	19.7	4.99 (1.92, 13.0)	3.55 (1.27, 9.93)
smokeless							
Never	10,101	NR ^f	1 [Reference]	1 [Reference]	NR ^f	1 [Reference]	1 [Reference]
Former	114	NR ^f	3.19 (1.95, 5.22)	2.26 (1.34, 3.81)	NR ^f	4.48 (2.53, 7.92)	2.83 (1.49, 5.38)
Past 30 days	56	NR ^f	1.42 (0.25, 8.00)	0.62 (0.14, 2.77)	NR ^f	2.60 (0.33, 20.3)	0.93 (0.18, 5.38)
Female (vs. male)				1.01 (0.82, 1.24)			0.87 (0.65, 1.18)
Age (range, 12-17 years)				1.26 (1.18, 1.35)			1.40 (1.26, 1.55)
Race/ethnicity (reference: non-Hispanic white)							
African American				0.63 (0.44, 0.90)			0.62 (0.38, 1.01)
Hispanic/Latino				1.00 (0.76, 1.30)			0.83 (0.57, 1.19)
Other				0.66 (0.45, 0.97)			0.47 (0.27, 0.82)
Parent's educational level of bachelors degree or				0.79 (0.63, 0.99)			0.59 (0.43, 0.82)

higher (vs no)				
Urban residence (vs non-urban)	1.03 (0.78, 1.37)			0.93 (0.64, 1.37)
Sensation seeking ^g	1.10 (1.06, 1.15)			1.10 (1.03, 1.16)
Alcohol ever use (vs no)	1.48 (1.18, 1.87)			1.24 (0.89, 1.75)
Lived with tobacco user (vs no)	1.39 (1.12, 1.73)			1.57 (1.16, 2.13)
Noticed cigarette warning ^h	1.03 (0.95, 1.11)			0.99 (0.89, 1.11)
Has favorite tobacco advertisement (vs.no)	1.64 (1.21, 2.23)			2.17 (1.46, 3.22)
Questionnaire in summer (vs. no)	0.66 (0.52, 0.85)			0.76 (0.54, 1.07)
Intercept	0.04 (0.03, 0.04)	0.00 (0.00, 0.00)	0.02 (0.01, 0.02)	0.00 (0.00, 0.00)

Abbreviations: CI, confidence interval; NR, not reported; OR, odds ratio

^a“Former” use indicates having ever used the product but not within the past 30 days.

^bFor cigarette use ever, the *F* statistic was 30.4 in model 1 and 20.9 in model 2 and the largest fraction of missing information was 0.009 in model 1 and 0.021 in model 2.

^cFor past 30-day cigarette use, the *F* statistic was 17.8 in model 1 and 16.4 in model 2 and the largest fraction of missing information was 0.018 in model 1 and 0.033 in model 2.

^dModel includes all former and past 30-days tobacco use categories.

^eModel includes all former and past 30-day tobacco use categories and the following wave 1 covariates: female, age, race/ethnicity, parental educational level, urban residence, sensation seeking, alcohol ever use, living with tobacco user, notice of cigarette warning labels, tobacco advertising receptivity, and summer season.

^fResults suppressed because of limited sample size.

^gA score from 3 to 15 that aggregated three 5-point Likert-type measures of affinity for frightening things, new and exciting experiences, and exciting and unpredictable friends.

^hA score on a 5-point scale with 1 indicating never and 5 indicating very often.

eTable 10. Associations of Noncigarette Tobacco Single-Product Ever Use and Polyuse With Subsequent Cigarette Use: Adjustment Variable Coefficients Shown

Wave 1 use	No. of Observations Before Multiple Imputation	Wave 2 Cigarette Ever Use (n=10,384) ^a			Wave 2 Cigarette Past 30-Day Use (n=10,380) ^b		
		Weighted, Unadjusted Cigarette Ever Use, %	OR (95% CI)		Weighted, Unadjusted Cigarette Past 30-Day Use, %	OR (95% CI)	
			Model 1 ^c	Model 2 ^d		Model 3 ^c	Model 4 ^d
Never use	9,058	3.5	1 [Reference]	1 [Reference]	1.6	1 [Reference]	1 [Reference]
E-cigarettes only	255	15.3	4.98 (3.39, 7.31)	2.99 (1.98, 4.53)	5.4	3.59 (1.96, 6.60)	2.12 (1.11, 4.03)
Hookah only	189	13.6	4.35 (2.79, 6.76)	2.35 (1.46, 3.77)	6.3	4.17 (2.24, 7.78)	2.15 (1.11, 4.16)
Combustibles only	114	11.4	3.57 (1.96, 6.48)	2.14 (1.14, 4.04)	7.9	5.34 (2.65, 10.8)	3.08 (1.43, 6.66)
Smokeless only	93	12.0	3.77 (1.97, 7.24)	1.88 (0.91, 3.86)	6.4	4.28 (1.72, 10.6)	1.53 (0.56, 4.19)
Polyuse	200	23.7	8.57 (6.00, 12.2)	3.95 (2.65, 5.90)	12.4	8.86 (5.54, 14.2)	3.81 (2.22, 6.54)
Female (vs. male)				1.00 (0.81, 1.23)			0.86 (0.64, 1.16)
Age (range, 12-17 years)				1.26 (1.18, 1.35)			1.39 (1.26, 1.55)
Race/ethnicity (reference: non-Hispanic white)							
African American				0.65 (0.46, 0.92)			0.63 (0.40, 1.02)
Hispanic/Latino				.98 (0.76, 1.28)			0.81 (0.60, 1.16)
Other				0.68 (0.47, 1.00)			0.50 (0.28, 0.87)
Parent's educational level of bachelors degree or higher (vs no)				0.80 (0.64, 1.00)			0.60 (0.44, 0.83)
Urban residence (vs non- urban)				1.06 (0.79, 1.40)			0.94 (0.64, 1.38)
Sensation seeking ^e				1.10 (1.06, 1.15)			1.10 (1.03, 1.17)
Alcohol ever use (vs no)				1.47 (1.16, 1.85)			1.23 (0.87, 1.72)
Lived with tobacco user (vs no)				1.40 (1.12, 1.73)			1.62 (1.20, 2.19)
Noticed cigarette warning ^f				1.04 (0.96, 1.12)			1.00 (0.90, 1.12)
Has favorite tobacco advertisement (vs.no)				1.60 (1.18, 2.16)			2.16 (1.47, 3.19)
Questionnaire in summer (vs. no)				0.66 (0.52, 0.85)			0.76 (0.54, 1.07)

Intercept	0.04 (0.03, 0.04)	0.00 (0.00, 0.00)	0.02 (0.01, 0.02)	0.00 (0.00, 0.00)
-----------	-------------------	-------------------	-------------------	-------------------

Abbreviations: OR = odds ratio; CI = confidence interval

^aFor cigarette use ever, the *F* statistic was 46.0 in model 1 and 24.0 in model 2 and the largest fraction of missing information was <.001 in model 1 and 0.019 in model 2.

^bFor past 30-day cigarette use, the *F* statistic was 24.4 in model 1 and 18.38 in model 2 and the largest fraction of missing information was <0.001 in model 1 and 0.030 in model 2.

^cModel includes all ever-only and poly-tobacco use categories.

^dModel includes all ever-only and poly-tobacco use categories and the following wave 1 covariates: female, age, race/ethnicity, parental educational level, urban residence, sensation seeking, alcohol ever use, living with tobacco user, notice of cigarette warning labels, tobacco advertising receptivity, and summer season.

^eA score from 3 to 15 that aggregated three 5-point Likert-type measures of affinity for frightening things, new and exciting experiences, and exciting and unpredictable friends.

^fA score on a 5-point scale with 1 indicating never and 5 indicating very often.